

**REVISED TMDL IMPLEMENTATION PLAN
FOR
BIG INDIAN CREEK WATERSHED**

**FECAL COLIFORM
in
BIG INDIAN CREEK
*HOUSTON COUNTY, GEORGIA***

Developed by

Middle Georgia Regional Development Center

in coordination with the

Big Indian Creek/Ocmulgee River Advisory Committee

April 30, 2003

Big Indian Creek Watershed Revised TMDL Implementation Plan

Overview

The stream segment under study is Big Indian Creek, which lies entirely within Houston County in the Big Indian Creek Watershed of the Ocmulgee River Basin.

Plan Preparation - Big Indian Creek

The Middle Georgia Regional Development Center (RDC) developed the revised implementation plan for the Big Indian Creek Watershed with the assistance of the Big Indian Creek/Ocmulgee River Advisory Committee. This committee included, but was not limited to, stakeholder representatives from the forestry industry, agriculture, local water authority staff, University of Georgia Extension Service, Department of Natural Resources, county staff, County Commissioners, concerned citizens, and property owners. The Middle Georgia RDC was under contract with the Georgia Environmental Protection Division prepare a revised TMDL implementation plan for the watershed.

The Committee met over a series of three meetings to formulate the revised implementation plan. The first meeting and public hearing, held on March 27, 2003 at 6:00 p.m., in the Commissioners' Board Room of the Houston County Annex located at 200 Carl Vinson Parkway, was primarily informational in nature (see attached agenda and accompanying minutes). An EPD representative was on hand to give a brief overview of the TMDL process and address some of the more technical aspects of TMDLs. The EPD brochure entitled "Watershed Wisdom – Georgia's TMDL Program" was distributed to attendees. The video of the same title was shown as well. There were nineteen representatives who attended and participated in this first meeting (see attached sign-in sheet.) For the first meeting, identified stakeholders and large property owners were sent invitation letters and information concerning the TMDL process. Additionally, an article was published in the *Macon Telegraph* concerning the upcoming meetings including the date, time, and location of the initial meeting (see attached article).

The second meeting was held at the same location at 6:00 p.m. on April 10, 2003 (see attached agenda and accompanying minutes). For this meeting, stakeholders who had attended the first meeting or expressed an interest in the process were sent letters inviting them to the public meeting. There were twelve representatives who attended and participated in this second meeting (see attached sign-in sheet.) Public comments were solicited and input was used to create a draft for the revised implementation plan.

The third and final meeting was held on April 24, 2003, in the Commissioners' Board Room of the Houston County Annex to allow the committee to suggest revisions and make final comments on the draft revised implementation plan before final submittal to EPD (see attached agenda and accompanying minutes.) There were ten representatives who attended and participated in this third meeting (see attached sign-in sheet.) A reporter from the *Macon Telegraph* attended each of the meetings and wrote a follow-up article that further explained the TMDL process and reported on the results of the stakeholders' meetings. This article was

published in the Houston County Edition of the *Macon Telegraph* and reported on the committee's activities (see attached article from the *Macon Telegraph*).

Additional comments were solicited from the stakeholder groups, who were encouraged to email or call the Middle Georgia RDC throughout this process with relevant information. Identified stakeholders were also encouraged to invite other interested parties that may not have been identified by the RDC.

Background - Big Indian Creek

The impacted segment of Big Indian Creek is located in the Big Indian Creek Watershed and runs from Mossy Creek to its terminal point at the Ocmulgee River. The segment falls totally within the confines of Houston County and is within the Ocmulgee River Basin. This seven-mile segment of Big Indian Creek is currently on the 303(d) list in the State of Georgia for violating the water quality standard for Fecal Coliform. The water use classification of this stream segment is fishing and it is identified as partially supporting its designated use.

The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material from humans, wildlife, or domesticated animals. The Georgia Environmental Protection Division currently uses fecal coliform levels as an indicator that a stream may be contaminated by pathogens or disease causing bacteria or viruses, which may also exist in fecal material. Some waterborne pathogenic diseases include typhoid fever, viral and bacterial gastroenteritis and hepatitis A. The presence of fecal contamination is an indicator that a potential health risk exists for individuals exposed to this water. EPD considers this health risk to be the same whether the contamination is caused by human or animal sources.

Fecal coliform bacteria may occur in ambient water as a result of the overflow of domestic sewage or non-point sources of human and animal waste. Non-point sources of fecal coliform bacteria are diffuse sources that cannot be identified as entering a waterbody through a single, distinguishable location. These sources, generally, but not always, involve accumulation of fecal material on land surfaces that eventually enter streams as a result of runoff during storm events.

TMDL Data - Big Indian Creek

Georgia EPD tested samples from Big Indian Creek at State Road 247 near Kathleen, Georgia from January to October of 1999 to detect the level of fecal coliform in the stream. For the months of May through October, fecal coliform should not exceed a geometric mean of 200 counts per 100ml on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. In the months of November through April, fecal coliform should not exceed a geometric mean of 1000 counts per 100ml, based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours, and not to exceed a maximum of 4,000 counts per 100ml for any sample. Data gathered during the June-July sampling period indicated the segment exceeded acceptable fecal coliform levels during this time. The seven-mile segment of Big Indian Creek was placed on the 303(d) list. Georgia EPD is recommending a 92 percent reduction in fecal coliform bacteria in Big Indian Creek to reach acceptable water quality levels.

Possible Pollutant Sources - Big Indian Creek

Stakeholders attempted to identify sources that could be responsible for high fecal coliform levels. The stakeholder group during the three meetings identified the following sources:

- Fecal matter originating from **wildlife** living in the abundance of forested land located along the stream. Wildlife in the area deposits feces onto land surfaces where it is transported during storm events to nearby streams.
- **Failing septic systems** from houses in and near the City of Perry. Although the impaired segment is predominantly located in forested areas, failing septic tanks may allow bacteria to seep into nearby streams that feed into Big Indian Creek;
- **Urban Run-off** associated with pet waste that has not been disposed of properly may be transported to streams by storm water run-off.
- **Improper disposal of septic tank sludge** near streams may allow seepage of fecal coliform into local water-bodies. As residential areas near Perry continue to grow beyond the City's public sewer system, this problem may increase if a strong education program is not developed.

The high fecal coliform levels are somewhat puzzling considering that the impacted stream segment is located in a forested area predominately owned by large timber companies. Additionally, a healthy riparian buffer, for the most part, borders the stream segment. Less than 3% of the land uses in located in the area are classified as commercial or residential. Therefore, an analysis of the land use in the area would indicate that wildlife is the primary cause of fecal coliform contamination in the stream.

Regulatory and Voluntary Measures: Existing and Future - Big Indian Creek

In addition to a host of federal and state laws administered by various agencies, there are a number of important local regulatory and voluntary actions, both existing and proposed, that may help to address the possible sources noted above. They are:

- The Houston County Health Department will continue to review locations and plans for septic tank installation to ensure state regulations are being met. On-site inspections of new septic tanks will be continued to ensure proper installation.
- Houston County will continue to enforce its Solid Waste Ordinance to eliminate illegal dumping in county streams and waterways.
- DNR volunteer instructors will attempt to educate hunters of proper disposal of animal and human waste during hunter safety course offered to all area hunters.
- Houston County intends to adopt the Part V Environmental Criteria as mandated by the Georgia Growth Planning Act during their next Comprehensive Plan update. This will establish standards and procedures pertaining to the protection of river corridors, mountain tops, water supply, watersheds/reservoirs, groundwater recharge areas, and wetlands.
- Various partners will participate in public education measures, beginning with the TMDL Implementation Plan and include other water quality related issues.

- The implementation of an Adopt-A-Stream program was also recommended. The program could be utilized through various organizations and groups throughout the watershed. The program could provide updates on current stream conditions in the future as the requisite funding and support are developed. The Adopt-A-Stream program is also a valuable education tool when active in local schools and service groups.
- Local farmers will continue to follow Agriculture Best Management Practices, which will include development of waste and nutrient disposal plans.
- Local Development Codes regulate minimum lot size for houses on septic tanks, as well as enforce stream buffer requirements for new development.

Schedule for Implementation - Big Indian Creek

The following will be tentatively initiated and continued past 2003:

- Houston County will continue to enforce Solid Waste Ordinance Ordinance.
- Various public education measures performed by the UGA Extension Service and other public and private agencies.
- Houston County Health Department to continue review of septic tank placement and installation.
- Houston County and non-profit organizations will undertake additional testing to better determine problem.
- Hunter education about illegal dumping

The following will be tentatively initiated and continued past 2004:

- Possible Adopt-A-Stream Program established.

The following will be tentatively initiated and continued past 2007:

- Houston County will adopt Part V Environmental Criteria as part of their Comprehensive Plan update.

Monitoring Plan - Big Indian Creek

Further monitoring of the fecal coliform concentrations at the current as well as additional monitoring stations in Big Indian Creek is needed to better characterize sources of fecal coliform bacteria and document future reduction of loading. More frequent testing will also assist in the assessment of the problem by providing improved historic trend analysis and allowing for better assessment of the affects of natural events, such as storms and droughts. Participants in Houston County recommend sampling Big Indian Creek at different locations along the segment during 2003 using EPD's testing protocol in an attempt to better define the sources contributing to the high fecal coliform readings.

Criteria to Determine Substantial Progress - Big Indian Creek

- Additional monitoring of stream by Houston County and local civic and environmental organizations. Should monitoring reveal similar fecal coliform bacteria levels, Houston County will be able to better determine the sources of the pollutant and target specific programs to address these sources.

- Adoption by Houston County of Part V Environmental Ordinances;
- Continued enforcement of Solid Waste ordinance by Houston County;
- Creation of Adopt-A-Stream Program by various partners;
- Continued inspections of new septic tanks;
- Continued addressing proper waste disposal during hunter education courses;
- Development of outreach and public education programs.

Funding - Big Indian Creek

- **Houston Community Greenspace Fund:** The Community Greenspace Program will continue to purchase land along streams in the watershed to establish a greenway that will ensure the preservation of riparian buffers.
- **US EPA Section 604(b) funds:** Federal grant funds administered by the Department of Natural Resources for the State of Georgia. Part of these funds allow Regional Development Centers to perform further development of plans to study water quality problems, perform watershed evaluations, conduct strategic monitoring, and characterize pollution sources for 303(d) streams.
- **US EPA Watershed Surveys and Planning Program - Small Watershed Program:** This program provides planning assistance to local agencies for the development of coordinated water and related land resources programs in watersheds and river basins.
- **Corporate Sponsors:** Keep America Beautiful Affiliates and environmental organizations will solicit funds from corporate sponsors to help pay for additional testing and education programs.

Conclusion - Big Indian Creek

Big Indian Creek presents an interesting problem for local officials, as the stream segment is relatively sheltered from normal contributors of fecal coliform bacteria, due to being bordered by forestland owned by large timber companies. Therefore, stakeholders have attempted to identify other reasons for the high levels.

The Big Indian Creek/Ocmulgee River Advisory Committee believes that contaminants may be entering the stream segment from the Big Indian Creeks tributaries. Therefore, the committee recommends that additional testing be done. An increased number of sampling stations, and samples taken more often, will give local officials a better view of the watershed as a whole and will allow decision makers to target programs to address specific problems.

STATE OF GEORGIA TMDL IMPLEMENTATION PLAN WATERSHED APPROACH Ocmulgee River Basin

Local Watershed Governments

Middle Georgia RDC
Houston County
Pulaski County
City of Perry

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies. **With input from appropriate stakeholder groups, a TMDL Implementation Plan has been developed for a cluster of impaired streams and the corresponding pollutants.** The impaired streams are located in the same sub-basin identified by a HUC10 code (Figure 1).

This Implementation Plan addresses an action plan, education/outreach activities, stakeholders, pollutant sources, and potential funding sources affecting the sub-basin. In addition, the Plan describes (a) regulatory and voluntary practices/control actions (*management measures*) to reduce target pollutants, (b) milestone schedules to show the development of the management measures (*measurable milestones*), (c) a monitoring plan to determine the efficiency of the management measures and measurable milestones, and (d) criteria to determine whether substantial progress is being made towards reducing pollutants in impaired waterbodies. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia. Following this section is information regarding individual segments.

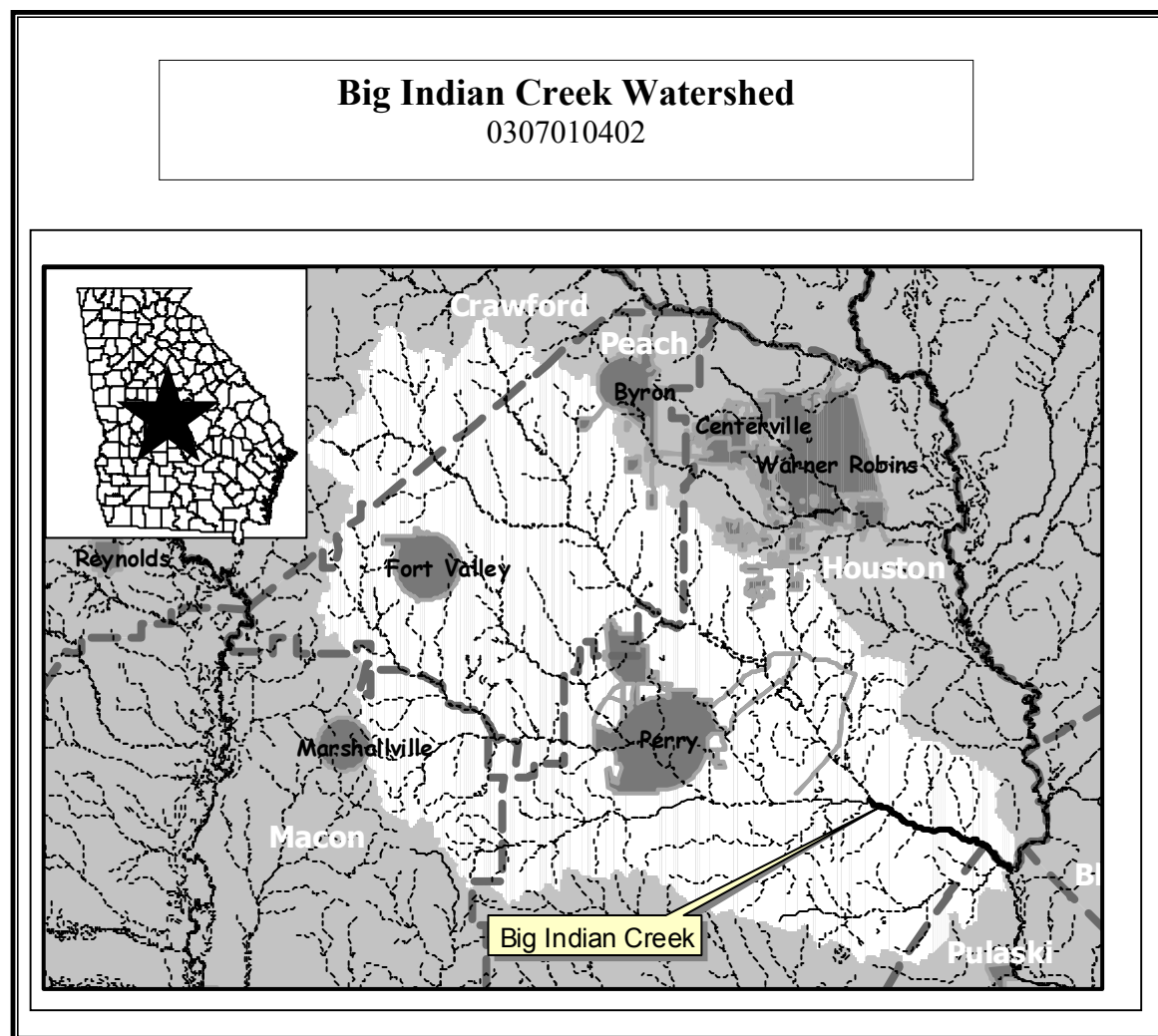


FIGURE 1

Impaired Waterbody*	Impaired Stream Location	Impairment
1. Big Indian Creek	Mossy Creek to Ocmulgee River	Fecal Coliform

*These Waterbody Numbers are referenced throughout the Implementation Plan.

Action Plan for

Big Indian Creek Watershed
0307010402

POLLUTANT:	SOURCE:	EFFECT:	WHAT CAN I DO?	
			At Home: Community, School	At Work: Business, Government
<input type="checkbox"/> Dissolved Oxygen (DO) <input checked="" type="checkbox"/> Fecal Coliform (FC) <input type="checkbox"/> Sediment <input type="checkbox"/> Metals <input type="checkbox"/> Fish Consumption Guidelines (FCG) <input type="checkbox"/> Other (Please List)	<input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Urban <input type="checkbox"/> Agriculture <input type="checkbox"/> Forestry <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Other (Please List) Wildlife Failing Septic Systems Urban Run-off / Pets Improper disposal of septic tank sludge	<input type="checkbox"/> Habitat <input checked="" type="checkbox"/> Recreation <input type="checkbox"/> Drinking Water <input type="checkbox"/> Aesthetics <input type="checkbox"/> Other (Please List)	<ul style="list-style-type: none"> Regular Septic Tank Maintenance Establish Adopt-A-Stream Program Dispose of hunting and camping waste materials properly Dispose of pet waste properly Ensure riparian buffers and wetlands are left undisturbed 	<ul style="list-style-type: none"> If involved with agriculture follow all established Best Management Practices Enact Pooper-Scooper Laws Properly dispose of septic sludge Treat storm water Run-off Adopt Conservation Subdivision Ordinance Encourage the establishment of local Adopt-A-Stream Program

INFORMATION/EDUCATION/OUTREACH ACTIVITIES

An education/outreach component will be used to enhance public understanding of and participation in implementing the TMDL Implementation Plan. List of all previous and planned information/education/outreach activities.

Responsible Organization Or Entity	Description	Impacted Waterbodies*	Target Audience	Anticipated Dates (MM/YY)
Extension Service	Public information on Agriculture Best Management Practices	Big Indian Creek	Farmers and Agribusinesses	Ongoing
Extension Service	Display at Agriculture Center	Big Indian Creek	Youth and Agribusinesses	09/03
Extension Service	Provide public information and data on conservation programs	Big Indian Creek	Co. Residents and Developers	Ongoing
Houston Co. Public Works Department	Bill inserts concerning TMDLs and NPDES Phase II Outreach	Big Indian Creek	County Residents	12/03
Houston Co. Community Planner	Public Service Announcements and Education Materials	Big Indian Creek	County Residents	09/03
Press Release	List of "Do's and Don'ts" related to dumping of waste materials	Big Indian Creek	Hunters and Campers	11/03
KAB affiliates and Extension Service	Establish Adopt-A-Stream Programs in Houston County	Big Indian Creek	Students and Civic Groups	12/03

STAKEHOLDERS

EPD encourages public involvement and the active participation of stakeholders in the process of improving water quality. Stakeholders can provide valuable information and data regarding their community and the impaired water bodies and can provide insight and/or implement management measures.

List of local governments, agricultural organizations or significant landholders, commercial forestry organizations, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed.

Name/Organization	Address	City	State	Zip	Phone	E-Mail
Russell Adams, Robins AFB						
David Aughtry,	191 Peachtree St., NE, 9th Floor	Atlanta	GA	30303		
C. Brooks Bailey, Pulaski County Sole Commissioner	P. O. Box 29	Hawkinsville	GA	31036		brooks.bailey@gsccca.org
Ronnie Barentine, CEA	P. O. Box 240	Hawkinsville	GA	31036		
Glenn Barton, Twiggs County Administrator	P. O. Box 202	Jeffersonville	GA	31044		
Mike Beecham, City of Perry	P. O. Box 2030	Perry	GA	31069-0019		mike.beecham@perryga.org
David Bennett, GA Soil & Water Conservation Comm.	P. O. Box 8024	Athens	GA	30603		
Ray Bennett, Twiggs County Commission	P. O. Box 202	Jeffersonville	GA	31044		
Katie Jo Berkshire, Hawkinsville-Pulaski Chamber	P. O. Box 447	Hawkinsville	GA	31036		
Peggy Bledsoe, County Extension Service	P. O. Box 1001	Perry	GA	31069		
Mike Brumfield, City of Centerville	500 N. Houston Lake Boulevard	Centerville	GA	31028-1099		cvwater@hatmail.net
Lucious Busby, NRCS	County Agricultural Building	Hawkinsville	GA	31036		
Willie Chance, Houston County Extension Service	200 Carl Vinson Parkway	Warner Robins	GA	31088		wchance@uga.edu
Roger Coleman, Pulaski County Health Department	P. O. Box 187	Hawkinsville	GA	31036		
Jacob Cox, Houston County Community Planner	200 Carl Vinson Parkway	Warner Robins	GA	31088		
Bobby Cribb, Greater Warner Robins Chamber	1420 Watson Boulevard	Warner Robins	GA	31093-3493		
Joe Duckworth, Cattlemen's Association	299 Barrows Ferry Road	Milledgeville	GA	31061		
Robbie Dunbar,	2018 Kings Chapel Road	Perry	GA	31069		robbiedunbar@alltel.net
Heather Duncan, Macon Telegraph	P.O. Box 4167	Macon	GA	31208	744-4225	hduncan@macontel.com
Brent Dykes, Ga. SWCC	3014 Heritage Road, Suite 1	Milledgeville	GA	31061	445-5766	bdykes@gaswcc.org

Name/Organization	Address	City	State	Zip	Phone	E-Mail
Stephen Elkins, Macon Telegraph	115 Chestnut Rd.	Warner Robins	GA	31088		selkins@macontel.com
Steve Engle, Director of Management Services	200 Carl Vinson Parkway	Warner Robins	GA	31088		
David Epps, Georgia Forestry Commission	P. O. Box 62	Jeffersonville	GA	31044		
James Faunton, FSA	P. O. Box 45	Perry	GA	31069		
Sam Floyd, Central GA Soil & Water Cons. District	Route 1	Danville	GA	31017		
Robby Gibbs,	3651 Christopher Dr.	Macon	GA	31216		robbyg@mylink.net
Mike Giles, Georgia Poultry Federation	P. O. Box 763	Gainesville	GA	30503	(770) 532-0473	mike@gapf.org
Carl Gillespie,	354 W. College Street	Abbeville	GA	31001		
Lee Gilmour, Perry City Manager	P. O. Box 2030	Perry	GA	31069-6030		
John Harley, City of Centerville	500 N. Houston Lake Boulevard	Centerville	GA	31028-1099		jrh0923@alltel.net
Adriane Harris,	321 Harris Road	Perry	GA	31069		
Kay Hill, Weyerhaeuser Company	P. O. Box 239	Oglethorpe	GA	31068		
Charles Holloway, Houston County Schools	P. O. Drawer N	Perry	GA	31069		
Tracy Jackson, Twiggs County EMA/Water	P. O. Box 113	Allentown	GA	31003		TracyJackson24@yahoo.com
Richard Johnson, Ocmulgee River SWCD	2256 Highway 41 N	Perry	GA	31069		
Nathan Klaus, Georgia DNR - Nongame Wildlife	116 Rum Creek Drive	Forsyth	GA	31029	994-1438	naklaus@mindspring.com
Robert Lancaster, Ocmulgee River SWCD	Route 2, Box 1940	Hawkinsville	GA	31036		
Morgan Law, Houston County Development Auth.	151 Osigian Boulevard, Suite 150	Warner Robins	GA	31088		
Howard Martin, Ocmulgee River SWCD	Route 2, Box 2770	Hawkinsville	GA	31036		
Richard Matthews,	188 Tusten Street	Elberton	GA	30635		
Charles McCranie, NRCS	230 Foster Street, Suite C	Eastman	GA	31023-1500		
Charlie McGlamry,	108 Olympia Drive, Suite 201	Warner Robins	GA	31093		
M. Moore, Timberland Partners, LLP	c/o Canal Forest Resources E	Conway	SC	29526		
David Muse, Ocmulgee River SWCD	P. O. Box 35	Perry	GA	31069		

Name/Organization	Address	City	State	Zip	Phone	E-Mail
John Niederhofer, Water Resources Branch-Georgia EPD	4220 International Pkwy., Suite 101	Atlanta	GA	30354	(404) 675-1654	j_niederhofer@dnr.state.ga.us
Andy Page, NRCS	Agricultural Building	Perry	GA	31069-3361		
James Paul,	3555 Kingsboro Road	Atlanta	GA	30319		
John Purser,	Route 1, Box 635	Cochran	GA	31014		
Mark Risse, UGA Cooperative Extension Service	Driftmier Engineer Building	Athens	GA	30602		
Tony Rojas, Macon Water Authority	P. O. Box 108	Macon	GA	31202-0108		
Ned Sanders, Houston County Commission	200 Carl Vinson Parkway	Warner Robins	GA	31088		
Kathrone Sands,	3481 Paces Valley Drive NW	Atlanta	GA	30327		
William Segars, College of Agriculture/Envir. Sciences	University of Georgia	Athens	GA	30602		
Robert Shulstead, College of Agriculture/Envir. Sciences	University of Georgia	Athens	GA	30602		
R. G. Spires,	Route 2, Box 64	Danville	GA	31017		
Bruce Stripling, Houston County Extension Service	700 Spruce Street	Fort Valley	GA	31030		bstrip@uga.edu
Henry Talton,	105 Lamar Drive	Bonaire	GA	31005		
Donald Walker, City of Warner Robins	P. O. Box 1488	Warner Robins	GA	31099-1488		
Larry Walker, Weyerhaeuser Company	P. O. Box 238	Oglethorpe	GA	31068	(478) 472-5269	Larry.Walker@Weyerhaeuser.com
Dweda Warren,	% Big Indian Estates	Kathleen	GA	31047		
Mary Ann Weigand, City of Centerville	500 N. Houston Lake Boulevard	Centerville	GA	31028-1099		
Harold West, Georgia Forestry Commission	119 Highway 49 W	Milledgeville	GA	31061		
Dexter White, Public Works Department	P. O. Box 247	Macon	GA	31202		
Wayne Williams, Georgia Cattlemen's Association	1473 Hunting Club Road	Crawfordville	GA	30631		
John Wilson, Ocmulgee Riverkeeper	2340 Clayton Street	Macon	GA	31204		
James Worrall, City of Perry	P. O. Box 2030	Perry	GA	31069-6030		
Mark Wyzalek, Macon Water Authority	P. O. Box 108	Macon	GA	31202-0108		
WOD Timber Company, Inc.	P. O. Box 1403	Macon	GA	31202		

Name/Organization	Address	City	State	Zip	Phone	E-Mail
Weyerhaeuser Company	c/o Kay Mooney	Oglethorpe	GA	31068		
Fannie Smith Estate	c/o Hazel Brooks	Kathleen	GA	31047		
Peed Brothers, Inc.	P.O. Box 398	Butler	GA	31006		
R. G. Spires	Route 2, Box 64	Danville	GA	31017		
R. Timberlands, LLC	P. O. Box 728	Fernandina	FL	32035		
Dixie Plywood Company	P.O. Box 1408	Savannah	GA	31402		
T & S Hardwoods, Inc.	P. O. Box 1233	Milledgeville	GA	31061		
Angela Lance, Peed Brothers, Inc.	P.O. Box 398	Butler	GA	31006		

WATER BODIES/STREAMS COVERED IN THIS PLAN:

These impaired streams are located in the same sub-basin identified by a HUC10 code. Most of the information contained in this section comes from the 303(d) list and has been completed by employees of the EPD Water Protection Branch. Data that placed stream on 303(d) list will be provided upon request.

Waterbody Name #1	Location	Miles/Area Impacted	Use Classification	Partially Supporting/ Not Supporting (PS/NS)
Big Indian Creek	Mossy Creek to Ocmulgee River	7	Fishing	PS
Primary County	Secondary County	Second RDC	Source (Point/ Nonpoint)	
Houston	Pulaski		Nonpoint	
Pollutants	Water Quality Standards	Required Reduction	TMDL ID	Date TMDL Established
Fecal Coliform	1000/100 ml (geometric mean Nov. – April) 200/100 ml (geometric mean May – Oct.)	92%		February 2002

POLLUTANT SOURCES

It is important to recognize the potential source(s) causing water quality impairment. Each source must be controlled to comply with target TMDL/Load Allocations for each pollutant. Included is a description of how the sources contribute to the impairment and the waterbody that is impaired.

List of major nonpoint source categories and sub-categories or individual sources (Urban Runoff, Agriculture, Forestry, Municipal Sewage Treatment Plant)

Pollutant	Sources of Pollutants	Description of Contribution To Impairment	Impacted Waterbodies*
Fecal Coliform	Wildlife	Deposits feces into streams or onto land surfaces where it can be transported during storm events to nearby streams, illegal dumping of animal viscera.	Big Indian Creek
Fecal Coliform	Failing Septic Systems	Although the identified stream segment is predominantly forested, houses in Houston and Pulaski may have failing septic systems that seep into the creek's tributaries.	Big Indian Creek
Fecal Coliform	Urban Run-off / Pets	Pet feces may not be disposed of properly by pet owners, feces deposited onto land surfaces can be transported during storm events to nearby streams.	Big Indian Creek
Fecal Coliform	Improper disposal of septic tank sludge	Sludge removed from septic systems may not be disposed of properly, which may allow fecal material to be transported to nearby streams during storm events.	Big Indian Creek

MANAGEMENT MEASURES, MEASURABLE MILESTONES AND SCHEDULE

(i.e. Local codes and ordinances, Erosion and Sedimentation Control, Storm Water Management, Local water resource monitoring)

The following table lists management measures that have been or will be implemented to achieve water quality standards and the load reductions established in the TMDL. The management measures, including regulatory or voluntary actions or other controls by governments or individuals, specifically apply to the pollutant and the waterbody for which the TMDL was written. A description is provided of how these management measures are/will be accomplished through reliable and effective delivery mechanisms, and how these management measures are/will help achieve the target TMDL. Included is the source of the pollutant, anticipated/past effectiveness of the management measure (very effective, somewhat effective, not effective), the current status (i.e. enforced, in-progress, planning), and measurable milestones and schedule. Milestones are used to measure progress in attaining water quality standards and to determine whether management measures are being implemented.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Georgia Water Quality Act (OCGA 12-5-20)	Georgia DNR/EPD	Makes it unlawful to discharge excessive pollutants into waters of the State in amounts harmful to public health safety or welfare.	1964	On-going	Regulatory
Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness		
Fecal Coliform	Point and Non-Point Sources including wildlife, storm water runoff, and residential developments.	Big Indian Creek			
Measurable Milestones	Schedule		Comments		
	Start	End			
Georgia EPD is responsible for enforcement and compliance for listed sources of Fecal Coliform pollutants.	On-going				

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
New Septic Tank Installation	Houston County Health Department	Reviews location and plans for new septic tank installation to ensure state regulations are met. On-site inspection of new septic tanks to ensure proper installation.	N/A	In progress	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
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Fecal Coliform	Leaking or sub-standard septic systems	Big Indian Creek	
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Measurable Milestones	Schedule		Comments
	Start	End	

Plans and recommendations are reviewed on a case-by-case basis. Unresolved complaints are forwarded on to Ga. EPD for enforcement.	On-going	
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Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
DNR Hunter Safty Instructors	Georgia DNR	Hunter education of proper disposal of animal and human waste.		In progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
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Fecal Coliform	Animal viscera dumped in stream	Big Indian	
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Measurable Milestones	Schedule		Comments
	Start	End	

Incorporation into Hunter Safety Education classes	On-going	
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Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Houston County Solid Waste Ordinance	Houston County	Similar to Georgia Water Quality Act, this local ordinance outlaws dumping in the County, with particular respect to streams and waterways		On-going	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal Coliform	Animal viscera dumped in stream	Big Indian Creek	

Measurable Milestones	Schedule		Comments
	Start	End	
Houston County enforces ordinance on a case by case basis.	On-going		

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Georgia Agricultural Best Management Practices	Agribusinesses and farms	Cattle, swine, chicken and other agricultural businesses follow best management practices to ensure the preservation of clean water. These management practices include measures such as protection of riparian buffers and wetland preservation.		On-going	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal Coliform	Fecal matter from farm animals	Big Indian Creek	

Measurable Milestones	Schedule		Comments
	Start	End	
Agribusinesses can provide status reports as needed. Large farms are required to submit a nutrient disposal plan.	On-going		

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Local Development Codes	Houston County and City Governments	The local development codes regulate minimum lot size so that lots using septic tanks must have soils that will support the natural filtration of septic by-products.		On-going	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal Coliform	Residential septic tanks	Big Indian Creek	

Measurable Milestones	Schedule		Comments
	Start	End	
Development plans are reviewed on a case-by-case basis to ensure proposed subdivisions will not contribute to pollution problems.	On-going		

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Houston County Land Development Codes	Houston County	The local development codes require subdivisions being developed within 500 ft. of public sewer lines connect with the system.		On-going	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal Coliform	Residential septic tanks	Big Indian Creek	

Measurable Milestones	Schedule		Comments
	Start	End	
Development plans are reviewed on a case-by-case basis to ensure proposed subdivisions will be developed in accordance with local development codes.	On-going		

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/Projected Date	Status	Regulatory/Voluntary
Houston County Greenspace Program	Houston County	Cities and County Greenspace Program will acquire land along stream banks and wetland areas.	2002	On-going	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal Coliform	Urban runoff, agriculture	Big Indian Creek	

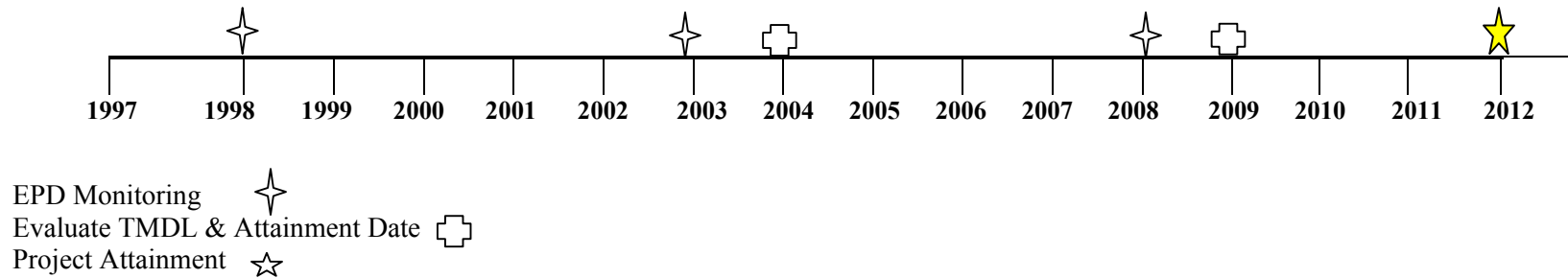
Measurable Milestones	Schedule		Comments
	Start	End	
Greenspace funds will be used to purchase environmentally sensitive areas, such as wetlands and stream buffers.	On-going		

POTENTIAL FUNDING SOURCES The identification and discussion of dedicated funding is important in determining the economic feasibility of the above-mentioned management measures.

[illegible]

PROJECTED ATTAINMENT DATE

The projected date to attain and maintain water quality standards in this watershed is 10 years from acceptance of the TMDL Implementation Plan by EPD.



MONITORING PLAN

The purpose of this monitoring plan is to determine the effectiveness of the target TMDL and the management measures being implemented to meet water quality standards. List of previous, current or planned/proposed sampling activities or other surveys. (Monitoring data that placed stream on 303(d) list will be provided if requested.)

Name Of Regulation / Ordinance Or Management Measure	Organization	Impacted Waterbodies*	Pollutants	Purpose/Description	Time Frame		Status (Previous, Current, Proposed)
					Start	End	
Additional Sampling	Local Water Systems	Big Indian	Fecal Coliform	Local water systems will sample the stream at different locations along the segment using EPD's testing protocol in an attempt to better define the problem.	2003	2003	Proposed
Additional Sampling	Adopt-A-Stream	Big Indian	Fecal Coliform	Local governments and environmental organizations support efforts to organize Adopt-A-Stream programs to provide additional sampling of stream at different locations and at different times along the stream segment using EPD's testing protocol in an attempt to better define the problem.	2003	2003	Proposed

CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE

The following set of criteria will be used to determine whether any substantial progress is being made towards reducing pollutants in impaired waterbodies and attaining water quality standards. Discussion on each criteria is recorded in the space provided. Additional relevant criteria are presented in comments.

Percent of concentration or load change (monitoring program) _____
Due to forests being the surrounding land use, should samples performed by local groups prove consistent with those gathered by EPD, local stakeholders request that EPD examine the criteria for listing this stream on the Section 301(d) list.

If monitoring results show that it is unlikely that the TMDL will be adequate to meet water quality standards, revision of the TMDL may be necessary.

- Categorical change in classification of the stream (delisting the stream is the goal) _____
Big Indian Creek should be classified as fishing or recreational under the current Georgia classification system. However, due to the fact that it is not used for swimming or wading, the lower TMDL level for Fecal Coliform during the Summer months may not be appropriate.

- Regulatory controls or activities installed (ordinances, laws) _____
No additional regulatory controls should be installed until after further testing has more accurately allowed the identification of specific sources of contamination.

- Best management practices installed (agricultural, forestry, urban) _____
Agribusiness are already strongly encouraged to follow BMP and the County Extension Service will increase its educational efforts concerning agriculture BMP.

COMMENTS

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**Environmental Protection Division of the Department of Natural Resources,
State of Georgia.**

TOGETHER WE CAN MAKE A DIFFERENCE!

Department Use Only:

Implementation Plan	Impaired Waterbodies			
	1	2	3	4
Action Plan				
Education/Outreach Activities				
Stakeholders				
Pollutant Sources Identified				
Description of Management Measures				
Measurable Milestones and Schedule				
Potential Funding Sources				
Monitoring Plan				
Criteria To Determine Whether Substantial Progress Is Being Made				
Supporting Documents				

**Big Indian Creek Watershed
Revised TMDL Implementation Plan
Appendix**

1. Sign-in sheet for March 27, 2003 Meeting
2. Agenda for March 27, 2003 Meeting
3. Minutes for March 27, 2003 Meeting
4. Sign-in sheet for April 10, 2003 Meeting
5. Agenda for April 10, 2003 Meeting
6. Minutes for April 10, 2003 Meeting
7. Sign-in sheet for April 24, 2003 Meeting
8. Agenda for April 24, 2003 Meeting
9. Minutes for April 24, 2003 Meeting